Bcom 1st Year Business Statistics Formula Notes

Bcom 1st Year Business Statistics Formula Notes :- In this article we are share to Bcom's Subject Business Statistics formula. I hope it is very helpful for you.
1. Individual Series
   (Direct method)
   \[ \text{mean}(x) = \frac{\sum x}{N} \]

   (Assume method) assume mid value
   \[ \bar{x} = \frac{\sum f_{x}x + \sum f_{x}}{N} \]

2. Discrete Series
   \[ \bar{x} = \frac{\sum f_{x}x}{N} \]
   \[ \bar{x} = \frac{\sum f_{x}x + \sum f_{x}}{N} \]

3. Continuous Series
   \[ \bar{x} = \frac{\sum f_{x}x}{N} \]
   \[ \bar{x} = \frac{\sum f_{x}x + \sum f_{x}}{N} \]
1. \text{Median} (\text{Median})

\[ \text{ Median } = \frac{\text{Size of } N + 1 \text{ items}}{2} \]

2. If the answer is received in decimal number, the answer is 5.5, 6.5

\[ \text{Median} = \frac{5\text{th Item} + 6\text{th Item}}{2} \]

3. \text{Discrete series}

\[ \text{Median} = \frac{\text{Size of } N + 1 \text{ items}}{2} \]

\[ \text{Note: Series is other in ascending order} \]
Continuous Series

\[ m = \text{series of} \ \frac{N}{2} \ \text{items} \]

\[ m = \frac{1 + (\frac{2-1}{2}) (m-c)}{f} \]

\[ c = \frac{f}{p} (m-c) \]

OR

\[ c = \frac{f}{p} \left( \frac{m}{2} - c \right) \]

Note: Before applying compulsory.
1. Individual Series

- Series of first frequency (विश्लेषणात्मक श्रेणी में आता पहली बार आए हुए)
- \( \text{Mode} = \frac{m_2 - m_1}{f_2 - f_1} \)

2. Discrete Series

- Series of first frequency (विश्लेषणात्मक श्रेणी में आता पहली बार आए हुए)
- \( \text{Mode} = \frac{f_2 - f_1}{m_2 - m_1} \)

\[ \begin{array}{c|c|c|c|c|c|c}
\text{x} & 5 & 6 & 7 & 8 & 9 & 10 \\\hline
f & 6 & 7 & 17 & 5 & 11 & 15 \\
\end{array} \]

- \( Z = 17 \)
- \( Z = 3m - 2x \)
Continuous series

Simple

\[ z = l_1 + \frac{f_1 - f_0}{f_1 - f_0 - f_2} (l_2 - l_1) \]

Alternate formula

\[ z = l_1 + \frac{f_2}{f_0 + f_2} (l_2 - l_1) \]
Geometric Means

Individual Series

\[ G_m = \sqrt[n]{x_1 \times x_2 \times \cdots \times x_n} \]

\[ G_m = \text{Geometric Mean} \]
\[ n = \text{Number of Items} \]
\[ x_1, x_2, \ldots, x_n \quad \text{etc. for values of items} \]

\[ G_m = \exp \left( \frac{\ln x_1 + \ln x_2 + \cdots + \ln x_n}{n} \right) \]

Weighted Geometric Means

\[ \log G_m = \text{antilog} \left[ \frac{\sum \log x_i}{n} \right] \]

Harmonic Means

\[ H_m = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \cdots + \frac{1}{x_n}} \]
1. Discrete versus & continuous

\[ G_m = \text{Antilog} \left( \frac{1}{n} \sum \log x_i f_i \right) \]

Harmonic Mean: \[ \frac{1}{\text{Harmonic Mean}} = \frac{1}{N} \sum \text{reciprocal of } x_i \]

\[ \text{WM} = \text{Harmonic Mean of } [\text{Reciprocal of } x_i] \]
Individually select

Quantile (Qg) g

Q1 = \frac{\text{Size of } \lfloor \frac{1(n+1)}{4} \rfloor \text{ th Item}}{n}

Q3 = \frac{\text{Size of } \lfloor \frac{3(n+1)}{4} \rfloor \text{ th Item}}{n}

Decimal Coefficient \( D7 = \frac{\text{Size of } 7(n+1) \text{ th Item}}{10} \)

Percentile (21.84%)

\( P_{180} = \frac{\text{Size of } 80(n+1) \text{ th Item}}{100} \)

Note: Series arrange in Ascending

1st Annu. percent e: London

Ex: 8, 75, 11, 25

8th Items + (19th - 8th Items) x 0.25

11th Items + (12th - 11th Items) x 0.25
Difference between

\[ a = \text{Size of } \{ \text{Unit} \} + \text{Items} \]
\[ b = \text{Size of } \frac{3(\text{unit})}{4} \]
\[ c = \text{Size of } \frac{7(\text{unit})}{10} \]

\[ p_0 = \text{Size of } \frac{\text{Interest} + \text{Items}}{100} \]

Never: Always: Cofo: P & model

Continuous: Better

\[ a_1 = \text{Size of } \frac{1(\text{unit}) + \text{Items}}{4} \]
\[ b_1 = \frac{4 + 5 - 4}{9 - 0} \]
\[ c_1 = \frac{8 + 6 - 8}{9 - 0} \]
\[ a_2 = \frac{4 + 5 - 4}{9 - 0} \]
\[ D_T = \frac{\text{Size of } Z(n)}{10} \text{ in Dense} \]

\[ D_T = L_1 + \frac{L_2 - L_1}{N} \text{ for } N \gg 1 \]

\[ P_90 = \frac{80\% \text{ of } P_0 \text{ in Dense} \times 100}{\text{Size of } Z(n)} \]

\[ P_90 = L_1 + \frac{L_2 - L_1}{N} \cdot (P_90 - L_1) \]

Note: Co to P0 compulsory.
Range = Large Value - Small Value

Inter Quartile Range = O_3 - O_1

Coefficient of Range = \frac{L-S}{L+S}

Percentile Range = P_{90} - P_{10}

Quartile Deviation = \frac{O_3 - O_1}{2}

Coefficient of Quartile Deviation = \frac{O_3 - O_1}{O_3 + O_1}
Mean deviation

\[ \bar{d} = \frac{1}{N} \sum |x - \bar{x}| \]

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Standard deviation

1. Direct method
   \[ SD \left( \bar{X} \right) = \sqrt{\frac{\sum (X_i - \bar{X})^2}{N}} \]

2. Short cut method
   \[ SD \left( X \right) = \sqrt{\frac{\sum (X_i - \bar{X})^2}{N}} \]

3. By original data (value square method)
   \[ S = \sqrt{\frac{\sum X_i^2}{N} - \left( \frac{\sum X_i}{N} \right)^2} \]

COEFF. OF SD = \frac{S}{\bar{X}}

COEFF. OF VARIANCE = \frac{\%}{100}

\[ \% = \frac{S^2}{\bar{X}^2} \times 100 \]

\[ S = \sqrt{\text{Variance}} \]
Discrete & Continuous Series

SD (c) = \sqrt{\frac{\sum x^2 f}{N} - \left(\frac{\sum x f}{N}\right)^2}

Direct method

SD (c) = \sqrt{\frac{\sum f x^2}{N} - \left(\frac{\sum f x}{N}\right)^2}

Same method

\sigma = \sqrt{\frac{\sum x^2 f}{N} - \left(\frac{\sum x f}{N}\right)^2} \text{ or } \sqrt{\frac{\sum f x^2}{N} - \left(\frac{\sum f x}{N}\right)^2}
Karl Pearson's measure of skewness
\[ Sk = \frac{x - \bar{x}}{s} \text{ or } Sk = 3 \left( \frac{x - \mu}{s} \right) \]

Karl Pearson's coefficient of skewness
\[ J = \frac{x - \bar{x}}{\frac{s}{\sqrt{6}}} \text{ or } J = 3 \left( \frac{x - \mu}{s} \right) \]

Bowler's measure of skewness
\[ So = \frac{Q_3 - Q_1}{2m} \]

Bowler's coefficient of skewness
\[ J_0 = \frac{Q_3 - Q_1 - 2m}{\frac{Q_3 - Q_1}{2m}} \]
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